WHAT IS CLAIMED IS:

1. A pulse-echo ranging system, comprising:

a transmitter for generating a transmit signal;

a transducer coupled to said transmitter for receiving said transmit signal, emitting energy pulses and detecting reflected energy pulses;

a receiver coupled to said transducer, said receiver having an input port for receiving said transmit signal, said receiver including a tunable filter for filtering said input signal and outputting a filtered signal;

a tuning module coupled to said receiver and having an input port for receiving said transmit signal and said filtered signal and outputting a phase correction signal corresponding to a phase difference between said transmit signal and said filtered signal; and

a controller having an input port for receiving said phase correction signal and a component for tuning said tunable filter based upon said phase correction signal, so as to minimize said phase difference.

2. The pulse-echo ranging system claimed in claim 1, wherein said tuning module includes a phase comparator, said phase comparator generating said phase correction signal based upon said phase difference.

3. The pulse-echo ranging system claimed in claim 2, wherein said phase correction signal is preset to a predetermined DC level and wherein said phase comparator adjusts said phase correction signal up or down based upon said phase difference.

4. The pulse-echo ranging system claimed in claim 2, wherein said tuning module includes a memory coupled to said phase comparator, said memory storing a value of said phase correction signal, and wherein said memory is

operatively coupled to said controller for reading said memory.

5. The pulse-echo ranging system claimed in claim 4, wherein said memory includes a capacitor for storing a DC voltage level of said phase correction signal.

6. The pulse-echo ranging system claimed in claim 1, wherein said tunable filter includes a LC bandpass filter circuit and said LC bandpass filter circuit includes a variable reactor.

7. The pulse-echo ranging system claimed in claim 6, wherein said variable reactor includes a plurality of capacitors selectively coupled to said LC bandpass filter circuit, wherein said plurality of capacitors are responsive to control signals from said controller for selectively switching into said LC bandpass filter circuit.

8. The pulse-echo ranging system claimed in claim 7, wherein said controller includes a component for generating said control signal, and said control signal couples selected ones of said plurality of capacitors to said LC bandpass filter circuit.

9. The pulse-echo ranging system claimed in claim 6, wherein said controller includes a filter adjustment module, said filter adjustment module calculating a resonant frequency of said tunable filter based upon said phase correction signal and further calculating a desired reactance value so as to minimize said phase difference, and wherein said controller generates a filter control signal to set said variable reactance based upon said desired reactance value.

10. The pulse-echo ranging system claimed in claim 1, wherein said transmit signal includes a plurality of pulses and said tuning module includes a pulse

counter for counting a number of pulses received by said tuning module based upon said transmit signal, and wherein said tuning module determines said phase difference after the number of pulses reaches a predetermined minimum.

11. The pulse-echo ranging system claimed in claim 10, wherein said pulse counter outputs an enable signal when said number of pulses reaches said predetermined minimum, and wherein said tuning module includes a phase comparator, said phase comparator receiving said transmit signal, said filtered signal and said enable signal, and said phase comparator performing phase comparison between said transmit signal and filtered signal in response to said enable signal.

12. A method of tuning a tunable filter in a receiver for a pulse-echo ranging system, the method comprising the steps of:

generating a transmit signal;

filtering said transmit signal through the filter to produce a filtered signal;

generating a phase correction signal based upon a phase difference between said filtered signal and said transmit signal; and

tuning the filter in response to said phase correction signal so as to minimize said phase difference.

13. The method claimed in claim 12, further including a step of presetting said phase correction signal to a predetermined level, and wherein said step of generating includes adjusting the level of said phase correction signal up or down based upon said phase difference.

14. The method claimed in claim 12, wherein said step of generating includes comparing said transmit signal and said filtered signal in a phase comparator.

15. The method claimed in claim 12, further including steps of storing a value of said phase correction signal in a memory and reading said value from said memory.

16. The method claimed in claim 15, wherein said memory includes a capacitor and said step of storing includes charging said capacitor.

17. The method claimed in claim 12, wherein said step of tuning further includes calculating a resonant frequency based upon said phase correction signal, calculating a desired reactance value for the filter so as to minimize said phase difference, and adjusting a variable reactance within the filter to match said desired reactance value.

18. The method claimed in claim 12, wherein said filter includes an LC bandpass filter circuit having a variable reactor, and wherein said step of tuning includes adjusting said variable reactor.

19. The method claimed in claim 12, wherein said transmit signal includes a plurality of pulses and wherein said method further includes a step of counting a number of pulses and performing said step of comparing only after receipt of a predetermined minimum number of pulses.